

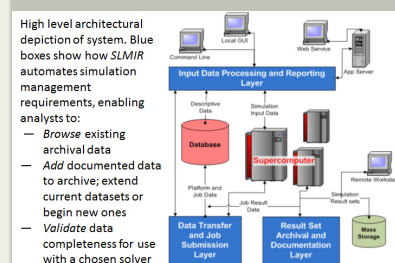
# Comprehensive Simulation Lifecycle Management for High Performance Computing Modeling and Simulation, Phase I

Completed Technology Project (2013 - 2013)



## Project Introduction

There are significant logistical barriers to entry-level high performance computing (HPC) modeling and simulation (M&S) users. Performing large-scale, massively parallel computations on modern supercomputing platforms is a very challenging task in and of itself. It requires huge amounts of analyst resources to construct datasets, transfer files, build codes, submit and monitor jobs, and analyze and archive results. This workflow requires significant attention to detail, and it is easy to miss steps, set up incorrect file or directory structures for datasets, spend inordinate effort to understand each computing platform and its unique job submission requirements, and decide how and where to archive potentially terabytes of simulation results. Collaboration among engineers is hampered by non-centralized storage of results, permission issues, and the sheer size of simulation result sets. Even for seasoned, veteran HPC users, the complexity of the overall HPC use process can be a barrier to daily use. We propose a system to streamline this workflow, provide audit trails for data used in simulations, code versions used, and storage locations of results, as well as integrating tools for file transfer, job submission, batch visualization, and other tasks that require engineer's time that is better spent considering the simulation itself. Further, the proposed SLMIR application (Simulation Lifecycle Management – IllinoisRocstar) sets up the infrastructure for collecting simulation data across an organization or organizations, so that engineers and scientists may discover information generated by others in their research areas, potentially saving time and money by leveraging previous work and avoiding duplication. The envisioned system targets users of HPC tools in the field, rather than developers writing those tools, since engineers and scientists in manufacturing and engineering industries are heavily invested in the results of using the tools.



## Comprehensive Simulation Lifecycle Management for High Performance Computing Modeling and Simulation

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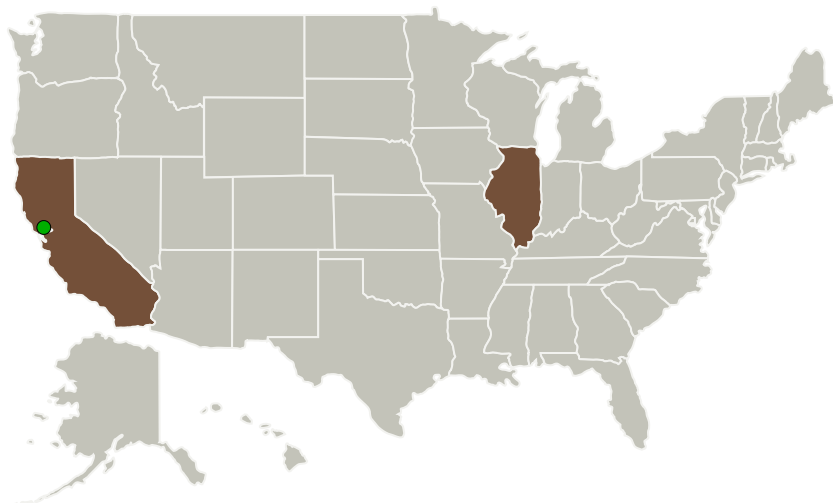
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## Primary U.S. Work Locations and Key Partners



| Organizations Performing Work | Role                    | Type        | Location                  |
|-------------------------------|-------------------------|-------------|---------------------------|
| IllinoisRocstar, LLC          | Lead Organization       | Industry    | Champaign, Illinois       |
| ● Ames Research Center(ARC)   | Supporting Organization | NASA Center | Moffett Field, California |

## Primary U.S. Work Locations

|            |          |
|------------|----------|
| California | Illinois |
|------------|----------|

## Project Transitions

**May 2013:** Project Start**November 2013:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/138055>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

IllinoisRocstar, LLC

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

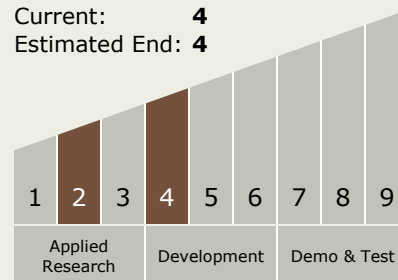
Carlos Torrez

**Principal Investigator:**

Mark D Brandyberry

## Technology Maturity (TRL)

Start: 2  
 Current: 4  
 Estimated End: 4

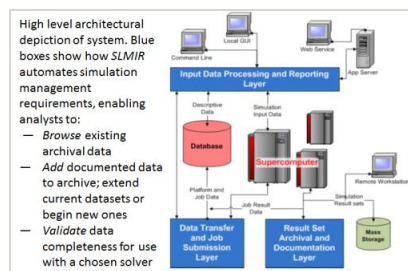


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## Images



### Project Image

Comprehensive Simulation Lifecycle Management for High Performance Computing Modeling and Simulation

(<https://techport.nasa.gov/image/136477>)

## Technology Areas

### Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.1 Software Development, Engineering, and Integrity
  - └ TX11.1.7 Frameworks, Languages, Tools, and Standards

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System